California State Highway System

FINAL

Roundabouts

Inventory

System Planning
June 2012

Caltrans

Overview

The California State Highway System (SHS) Roundabouts Inventory compiled by Caltrans provides an inventory of existing, programmed, and planned roundabouts located on the SHS. The inventory includes examples of where roundabouts have been successfully implemented on the SHS and includes a historical context for the purpose why the roundabout was installed. This document is a reflection of Caltrans' leadership role in developing project alternatives for at-grade intersections to maximize safety and to improve operations while being sensitive to community needs. Roundabouts help to maximize safety for drivers, pedestrians, cyclists, and reduce the use of traffic signals while improving mobility. For further information, please visit the Caltrans System Planning website at:

http://www.dot.ca.gov/hq/tpp/corridor-mobility

Disclaimer

The information and data contained in this document are for planning purposes only and should not be relied upon for final design of any project. Any information in this document is subject to modification as conditions change and new information is obtained. Although planning information is dynamic and continually changing, the Office of System and Freight Planning makes every effort to ensure the accuracy and timeliness of the information contained in the document. The information in this document does not constitute a standard, specification, or regulation, nor is it intended to address design policies and procedures.

The California Department of Transportation
Caltrans Improves Mobility Across California

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APPENDIX

Introduction

The purpose of this document is to provide basic roundabout information and an inventory of existing, programmed and planned roundabouts on the State Highway System (SHS), including those located at freeway ramp intersections.

The term ***roundabout*** is a British word[1] for a road junction in which vehicles move in one direction around a central island with priority given to the vehicles already in the circulating flow of the roundabout. The roundabout is a circular intersection that creates a circular traffic flow pattern using yield controls on each approach and signage to inform the driver about slowing down and recognizing who has the right of way. Vehicles enter the roundabout and navigate counter-clockwise with the option to make an immediate right-turn, go straight, or continue around the roundabout.

Roundabouts and traffic circles have similar characteristics; however traffic circles are different in several ways[2]. Specifically, roundabouts use a yield control on all entries. Traffic circles use stop signs, signals or a combination[3]. Roundabout intersections give the right-of-way to those already in the roundabout, while traffic circles require circulating traffic to yield to entering traffic. Furthermore, roundabouts provide pedestrian access only across the legs of the roundabout, behind the yield line. Traffic circles allow pedestrians access to the central island. Finally, in a roundabout, all vehicles circulate counter-clockwise and pass to the right of the central island. Traffic circles allow left-turning vehicles to pass to the left of the central island.

Figure 1: CA Roundabout Sign (D1-5)[4]

The circular intersection roundabout symbol (D1-5 sign) in the 2012 ***California Manual on Uniform Traffic Control Devices*** (2012 CA MUTCD) is the appropriate signage located prior to

reaching the roundabout. The 2012 Highway Design Manual (HDM), provides design guidance and should be utilized when planning and developing roundabouts on the SHS. The HDM emphasizes that the yield-controlled roundabout is now considered to be a viable alternative for a broad range of situations, highway facility types and operating conditions, such as high speeds and peak hour traffic volumes[5].

Benefits

Roundabouts can improve safety, decrease traffic congestion, improve air quality, and reduce environmental impacts, as compared to side-street stops or signalized intersections.

Safety Benefits

In comparison to roundabouts, signalized intersection accidents have higher rates of vehicle damage, injuries and fatalities. The **Federal Highway Administration (FHWA)** compiled the following nationwide non-roundabout intersection statistics for the year 2004[6]:

- ✓ 2.7 million intersection-related collisions
- ✓ 900,000 intersection-related injury collisions
- ✓ 9,117 intersection-related fatalities
- ✓ $96 billion nationally in financial losses from intersection-related collisions

The **Insurance Institute of Highway Safety (IIHS)**, in partnership with the FHWA[7] has shown that roundabouts typically achieve the following improved safety benefits as compared to signalized or side-street stop intersections. The roundabout benefits include:

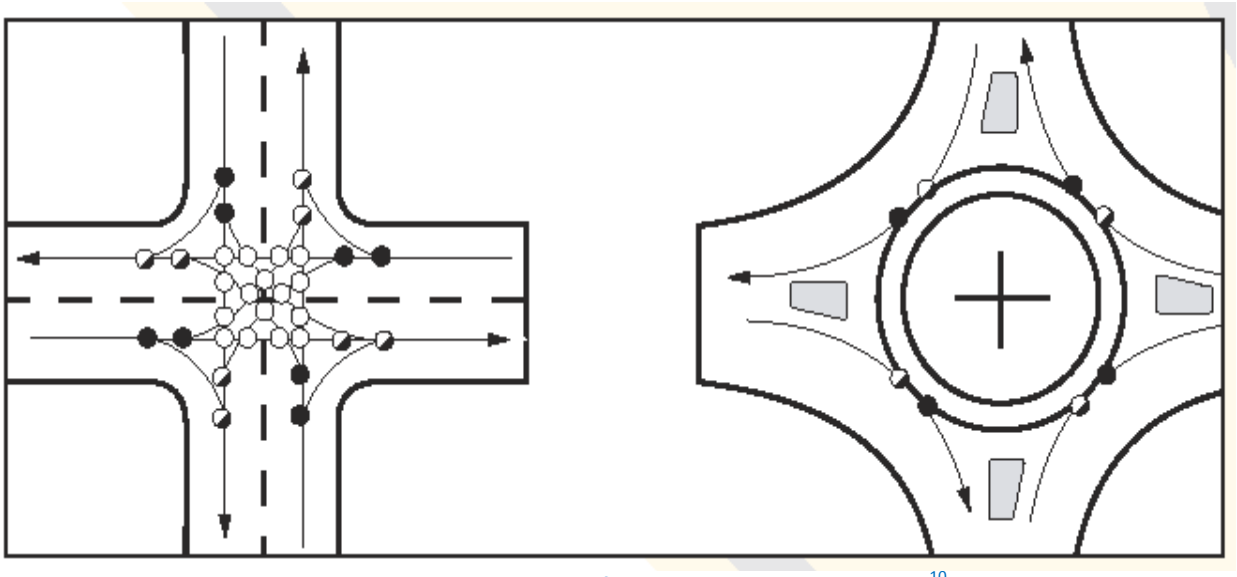
- ✓ 37 percent reduction in overall collisions
- ✓ 75 percent reduction in injury collisions
- ✓ 40 percent reduction in pedestrian collisions
- ✓ 75 percent fewer “conflict points” than a traditional intersection
- ✓ 90 percent reduction in overall fatalities

Design features of roundabouts limit the diameter of the circular roadway, which decreases vehicle speed, and reduces the risk of collisions as compared to signalized or side-street stop

intersections. Roundabout design features are more effective at guiding vehicles safely through intersections than reliance on driver obedience to traffic control devices such as signals and side-street stop signs.[8]. Single-lane roundabouts are particularly effective at improving safety.

Multi-lane roundabouts have many of the same safety performance characteristics as their simpler single-lane counterparts. However, due to the presence of additional entry lanes and the accompanying need to provide wider circulatory and exit roadways, multi-lane roundabouts introduce additional conflicts not present in single-lane roundabouts. Overall, there is an observed reduction of 35percent for single-lane and 76 percent for multi-lane in total and injury crashes, respectively, following conversion to a single or multi-lane roundabout[9].

Figure 2: Conflict Points - 32 Versus 8



Source: FHWA, Roundabout Informational Brochure & Guide[10]

Roundabouts have only 8 conflict points versus a traditional intersection, which has 32 conflict points. In roundabout intersections, none of these conflict points are at right angles, thus decreasing human and property damage when accidents do occur.

Roundabouts can improve traffic flow and significantly reduce traffic delays. Roundabouts reduce delay by allowing vehicles to continuously move through all legs of the intersection without any of the legs having stop signs or red lights. Roundabouts promote a continuous, circular flow of traffic, which allows more vehicles to travel through an intersection at a time. FHWA found that roundabouts increased traffic capacity by 30 percent-50 percent[11], compared to signalized intersections.

The Highway Capacity Manual (HCM) includes a new section on roundabout Level of Service (LOS) tables for performance measures[12]. The HCM states that for signalized or stop sign intersections, the average control delay (in seconds per vehicle) is used as the primary measure of performance. Control delay is the increased time of travel for a vehicle approaching or passing through signalized or stop sign intersection, compared with a free-flow vehicle if it were not required to stop at the intersection, such as roundabouts[13].

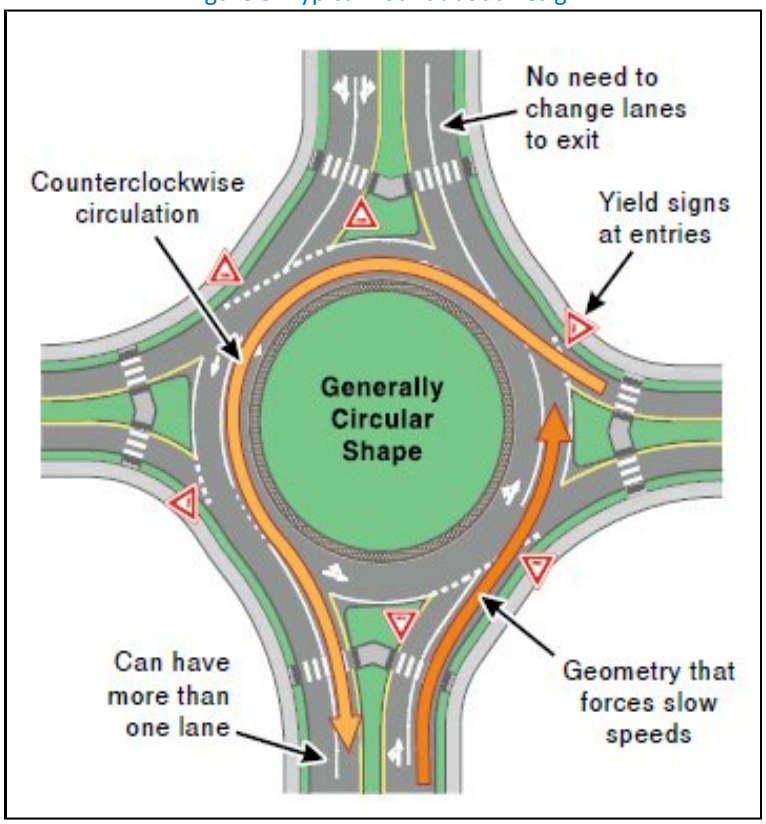
In 2006, the IIHS studied intersections in three states (New Hampshire, New York, and Washington)[14] where roundabouts replaced traditional signalized intersections and found:

- ✓ 89 percent average reduction in vehicle delays
- ✓ 56 percent reduction in vehicle stops

The design characteristics for single-lane and multi-lane roundabouts are similar for desirable maximum entry speeds of up to 20-25 mph for a single-lane roundabout and 25 to 30 mph for a multi-lane roundabout. Both roundabout types allow for a raised central island, which may have traversable aprons. Multi-lane roundabouts allow for 2 entry points per direction into the roundabout, compared with only 1 entry point for single-lane roundabouts. Single-lane roundabouts have the capacity to handle up to 25,000 vehicles per day and multi-lane roundabouts have the capacity to handle up to 45,000 vehicles per day[15]. The capacity of a Roundabout depends on the number of vehicles present at each Roundabout entry. The capacity of the entries is computed as a function of the other conflicting approaches. The maximum flow rate that can be accommodated mainly depends on two factors: the circulating flow and the geometric elements of the roundabout.

For Planning purposes and based on most conservative combination of the following factors; 10 percent AADT Peak Hour Factor, 52 percent to 58 percent Directional Distribution, and V/C Ratio of 0.85 to 1.00, single-lane Roundabouts can be expected to handle a peak hourly flow of between 2,000 to 2,500 VPH while double-lane Roundabouts can be expected to handle from 2,500 to 4,300 VPH[16].

Figure 3: Typical Roundabout Design



Source: NCHRP/FHWA Publication[17]

Environmental Benefits

Roundabouts benefit the environment by decreasing vehicle emissions when compared to traditional signed or signalized intersections. Both human and environmental health benefit from vehicles spending less time idling and not starting from a complete stop, which also reduces fuel consumption.

Studies in 2002[18] and 2004[19] by the IIHS demonstrated that roundabout intersections can reduce fuel consumption, when traversing roundabouts, rather than traditional intersections by approximately 30 percent per vehicle on a roundabout intersection for the year. The 2002 and 2004 studies measured vehicle emissions and concluded:

- ✓ 29 percent reduction in carbon monoxide emissions (2002)[20]
- ✓ 37 percent reduction in carbon dioxide emissions (2004)[21]

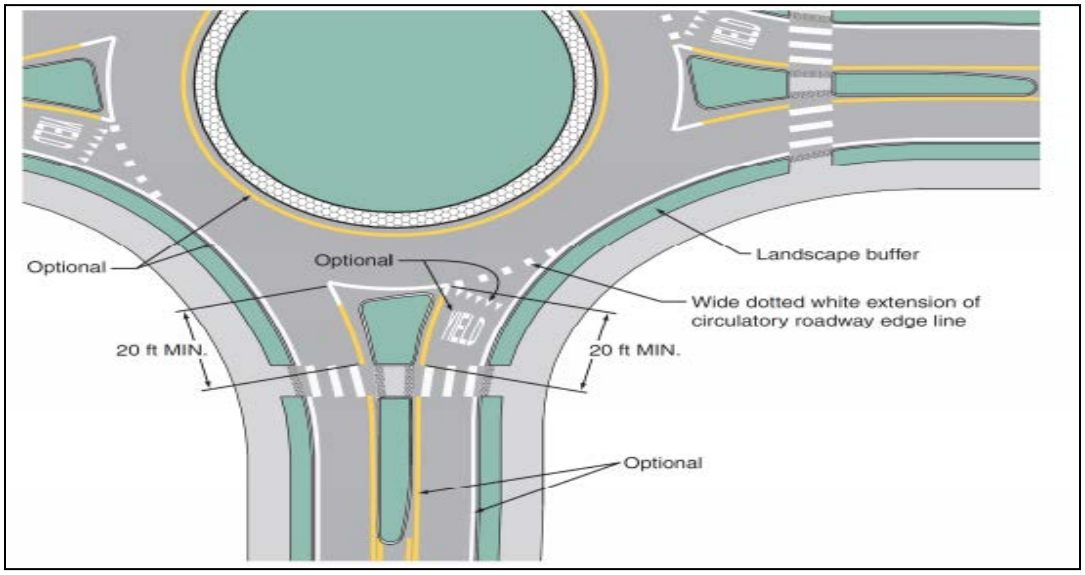
Design Features for Pedestrians and Bicyclists

Caltrans' design information bulletin on roundabouts states, "At single-lane approaches and departures, the pedestrian crossing should be located one car length (approximately 24 feet) away from the inscribed circle. At multi-lane approaches and departures, the pedestrian crossing should be located two car lengths (approximately 49 feet) away from the inscribed circle. In all cases, the pedestrian crossing shall be no closer than 19 feet from the inscribed circle."[22]

Pedestrian benefits include a much safer roundabout intersection to cross, compared to signalized intersections. Pedestrians cross only one direction of traffic at a time, with a pedestrian refuge area in the middle of the crossing. The pedestrian refuge area allows for pedestrians to wait for a safe crossing opportunity for traffic coming from the opposite direction.

FHWA's, ***Roundabouts: An Informational Guide***"[23] recommends terminating bicycle lanes well before the entrances to allow bicyclists time to merge into the stream of motorized traffic.

Figure 4: California Roundabout General Geometric Standards

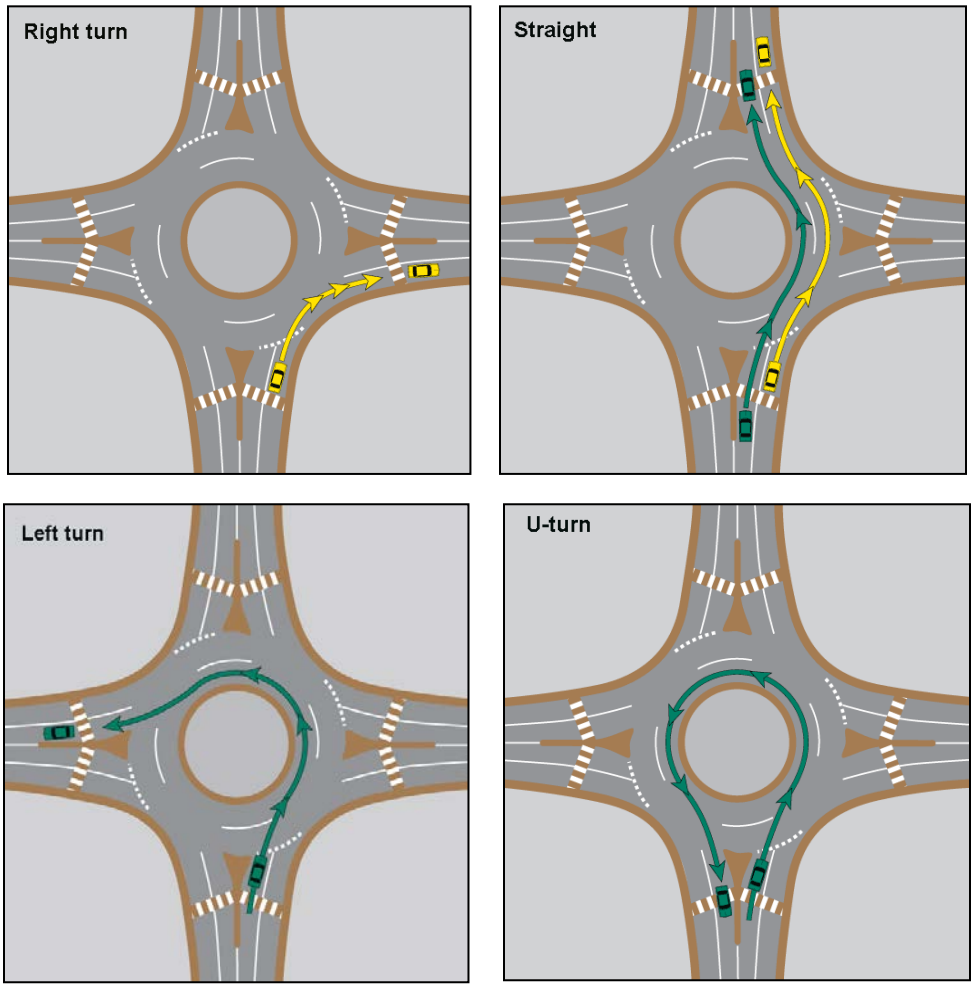


Source: Caltrans 2011 MUTCD[24]

Trucks, Buses, and Oversize Vehicles

Roundabout designs should consider, when applicable, all vehicle sizes from small economy cars to buses, large farm equipment, and semi-trucks with trailers. Roundabouts are commonly designed with a truck apron, a raised section of pavement around the central island that acts as additional lane width for larger vehicles. The back wheels of oversized vehicles can ride up on the truck apron to navigate the turn; but the apron height deters use by smaller vehicles. In multi-lane roundabouts, oversize vehicles and vehicles with trailers may straddle both lanes or make use of the apron while navigating through a roundabout.

Figure 5: Roundabout Maneuvering

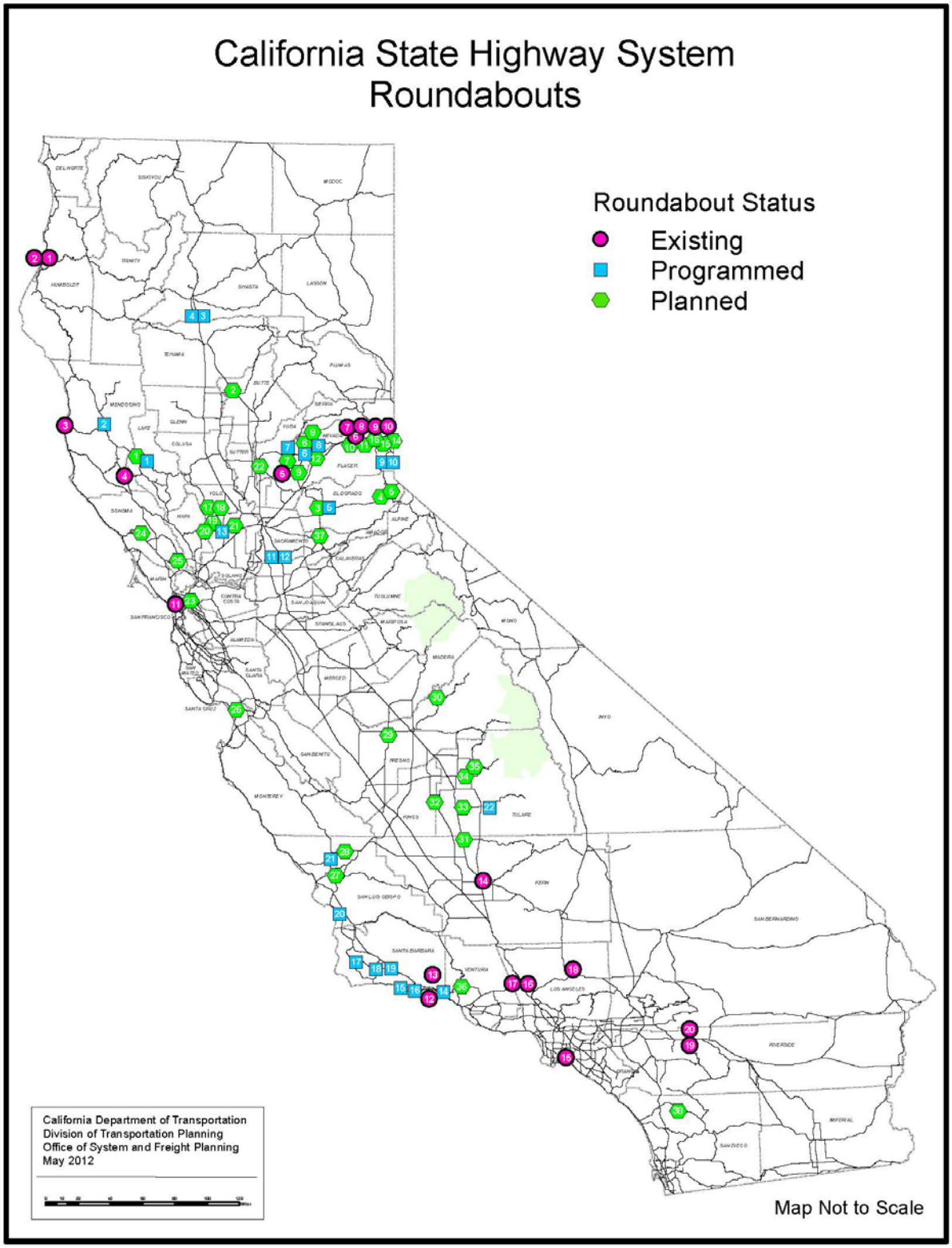


Source: Washington State Department of Transportation (WADOT)[25]

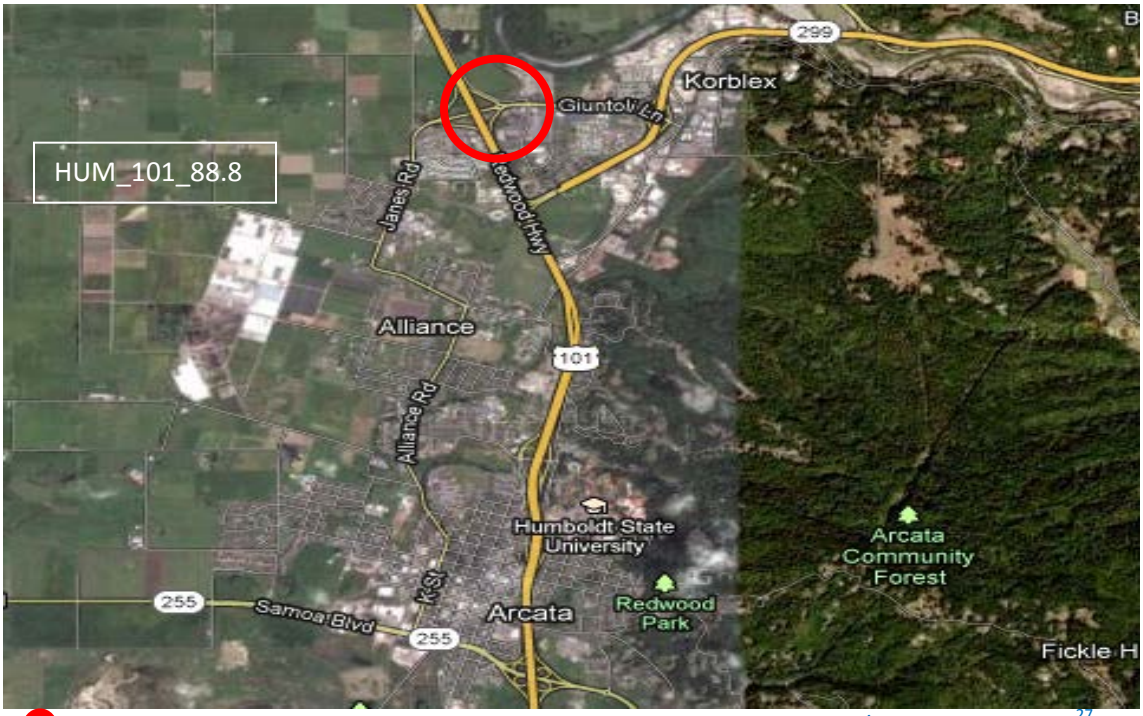
State Highway System Roundabout Inventory						
ID	District	CO	RTE	PM	Description	Page #
Existing						
1	D01	HUM	101	88.803	Northbound - U.S. 101/Giuntoli Lane	10
2	D01	HUM	101	88.803	Southbound - U.S. 101/Giuntoli Lane	10
3	D01	MEN	1	59.25	SR 1/Simpson Lane	13
4	D01	MEN	175	1.14	SR 175/Main Street/East Side Rd.	16
5	D03	NEV	20	R13.614	SR 20/E. Main Street/Idaho Maryland Rd	19
6	D03	NEV	80	14.048	Eastbound- SR 89/I-80	22
7	D03	NEV	80	14.048	Westbound - SR 89/I-80	22
8	D03	NEV	89	R000.826	SR 89 / Donner Pass Rd	25
9	D03	NEV	89	R000.751	SR 89 / Pioneer Trail	25
10	D03	NEV	89	1.15	SR 89N/Alder Road/Prosser Dam Road	28
11	D04	MRN	131	4.392	SR 131/Paradise Drive	31
12	D05	SB	101	12.969	U.S. 101/Milpas Street	33
13	D05	SB	144	0.87	SR 144/Five Points	36
14	D06	KER	204	4.779	SR 204/Chester Avenue	39
15	D07	LA	1	3.613	SR 1/Lakewood Blvd	41
16	D07	LA	5	R56.749	Northbound - I-5/Hasley Canyon Road	43
17	D07	LA	5	R56.763	Southbound - I-5/Hasley Canyon Road	43
18	D07	LA	138	48.461	SR 138/E. Palmdale Blvd	46
19	D08	RIV	10	R17.501	Eastbound - I-10/Seminole Drive	49
20	D08	RIV	10	R17.501	Westbound- I-10/Seminole Drive	49
Programmed						
1	D01	LAK	20	12.199	CON Phase. SR 20/Nice-Lucerne Cutoff	TBD
2	D01	MEN	101	49.0	PS&E U.S. 101/Sherwood Road	TBD
3	D02	SHA	5	R004.289	PA/ED Northbound I-5/Deschutes Drive	TBD
4	D02	SHA	5	R004.289	PS&E Southbound I-5/Deschutes Drive	TBD
5	D03	ED	50	17.017	PA/ED U.S. 50/Placerville Drive	TBD
6	D03	NEV	20	R15.91	PA/ED SR 20/Gold Flat/Ridge Road	TBD
7	D03	NEV	20	R11.96	PA/ED SR 20/McCourtney Road	TBD
8	D03	NEV	20	R17.39	PA/ED SR 20/Uren Street	TBD
9	D03	PLA	28	9.72	PS&E SR 28/Bear Street	TBD
10	D03	PLA	28	9.9	PS&E SR 28/Coon Street	TBD
11	D03	SAC	99	3.525	PA/ED SR 99 SB/SR 104/Twin Cities Road	TBD
12	D03	SAC	99	3.525	PA/ED SR 99 NB/SR 104/Twin Cities Road	TBD
13	D03	YOL	128	9.014	PS&E SR 128/Walnut Lane	TBD
14	D05	SB	101	3.06	PS&E U.S. 101/Ogan Road	TBD
15	D05	SB	217	2.3	PA/ED Phase. SR 217/Hollister Avenue	TBD
16	D05	SB	225	1.76	PA/ED Phase. SR 225/Las Positas & Cliff	TBD

17	D05	SB	246	12.27	CON Phase. SR 246/La Purisima Road	TBD
18	D05	SB	246	30.28	PA/ED Phase. SR 246/Alamo Pintado	TBD
19	D05	SB	246	R34.601	PS&E and ROW Phase. SR 246/SR 154	TBD
20	D05	SLO	1	10.9	PA/ED Phase. SR 1/Halcyon Road	TBD
21	D05	SLO	46	R21.940	ROW Phase. SR 46/West U.S. 101	TBD
22	D06	TUL	190	21.1	PA/ED Phase SR 190/Worth Road	TBD
Planned						
1	D01	LAK	20	8.3	Conceptual SR 20/SR 29	TBD
2	D03	BUT	99	R36.250	Conceptual SR 99/Eaton Road	TBD
3	D03	ED	50	17.017	Conceptual U.S. 50/Placerville Drive	TBD
4	D03	ED	50	70.62	Conceptual U.S. 50/SR 89	TBD
5	D03	ED	50	71	Conceptual U.S./Apache	TBD
6	D03	NEV	20	R15.91	Conceptual SR 20/Gold Flat/Ridge Road	TBD
7	D03	NEV	20	R11.96	Conceptual SR 20/McCourtney Road	TBD
8	D03	NEV	20	R17.39	Conceptual SR 20/Uren Street	TBD
9	D03	NEV	49	R13.642	Conceptual SR 49/McKnight Way	TBD
10	D03	NEV	80	0.05	Conceptual I-80/SR 267	TBD
11	D03	NEV	80	13.19	Conceptual I-80/Cold Stream Road	TBD
12	D03	NEV	174	6.83	Conceptual SR 174/Brunswick	TBD
13					Roundabout #13 intentionally left blank[26]	
14	D03	NEV	267	M001.419	Conceptual SR 267/Brockway Road	TBD
15	D03	NEV	267	M0.0	Conceptual I-80 Eastbound	TBD
16	D03	NEV	267	M0.0	Conceptual I-80 Westbound	TBD
17	D03	YOL	16	28.266	Conceptual SR 16/S. County Road 21A	TBD
18	D03	YOL	16	29.76	Conceptual SR 16/N. Woodland Ave	TBD
19	D03	YOL	128	9.014	Conceptual & PS&E SR 128/Walnut Lane	TBD
20	D03	YOL	128	8.906	Conceptual SR 128/Dutton Street	TBD
21	D03	YOL	128	9.149	Conceptual SR 128/Morgan Street	TBD
22	D03	YUB	70	R9.092	Conceptual Powerline Road/SR 70	TBD
23	D04	ALA	80	6.62	Conceptual I-80/Gilman Street	TBD
24	D04	SON	116	19.39	Conceptual. SR 116/Mirabel Road	TBD
25	D04	SON	116	46.755	Conceptual. SR 116/SR 121/Fremont	TBD
26	D05	SCR	152	T002.503	PID Phase. SR 152/Freedom Blvd	TBD
27	D05	SLO	101	48.331	Conceptual. U.S. 101/Del Rio Road	TBD
28	D05	SLO	46	31.8	Conceptual. SR 46/Union Road	TBD
29	D06	FRE	145	32.8	Conceptual SR 145/West Jensen Ave	TBD
30	D06	FRE	168	T030.201	Conceptual SR 168/Auberry Road	TBD
31	D06	KER	155	R1.5	Conceptual. SR 155/Browning Road	TBD
32	D06	KIN	43	1.456	Conceptual SR 43/Whitley Road	TBD
33	D06	TUL	190	4.4	Conceptual SR 190/Bliss Lane	TBD
34	D06	TUL	198	R14.53	Conceptual SR 198/Farmersville/Noble	TBD

35	D06	TUL	245	7.066	Conceptual SR 245/SR 216	TBD
36	D07	VEN	150	16.577	Conceptual SR 33/SR 150	TBD
37	D10	AMA	49	17.22	Conceptual. Pre-PA/ED SR 49/Main St	TBD
38	D11	SD	76	32.87	Conceptual. SR 76/Valley Center Road	TBD


California State Highway System
Roundabouts
Roundabout Status
Existing
Programmed
Planned
California Department of Transportation
Division of Transportation Planning
Office of System and Freight Planning
May 2012
Map Not to Scale

District 1–Humboldt County–Arcata, CA
U.S. Route 101 and Guintoli Lane

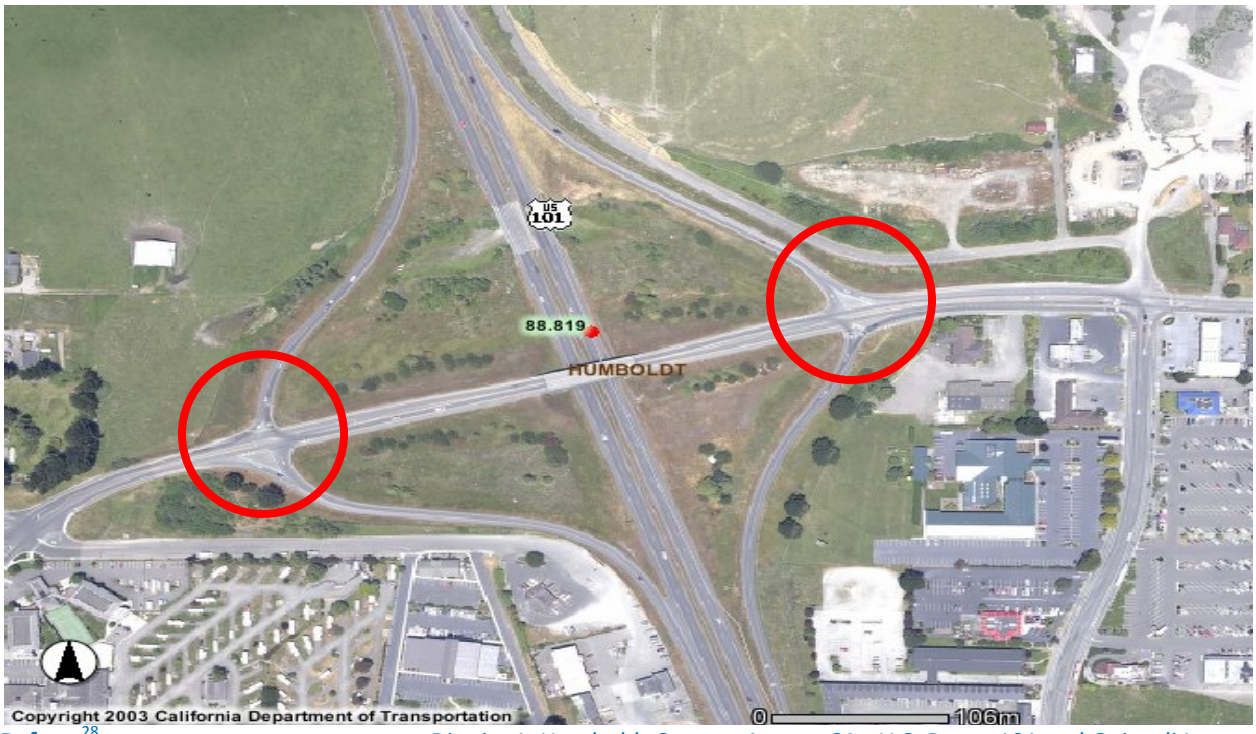


= Project Area

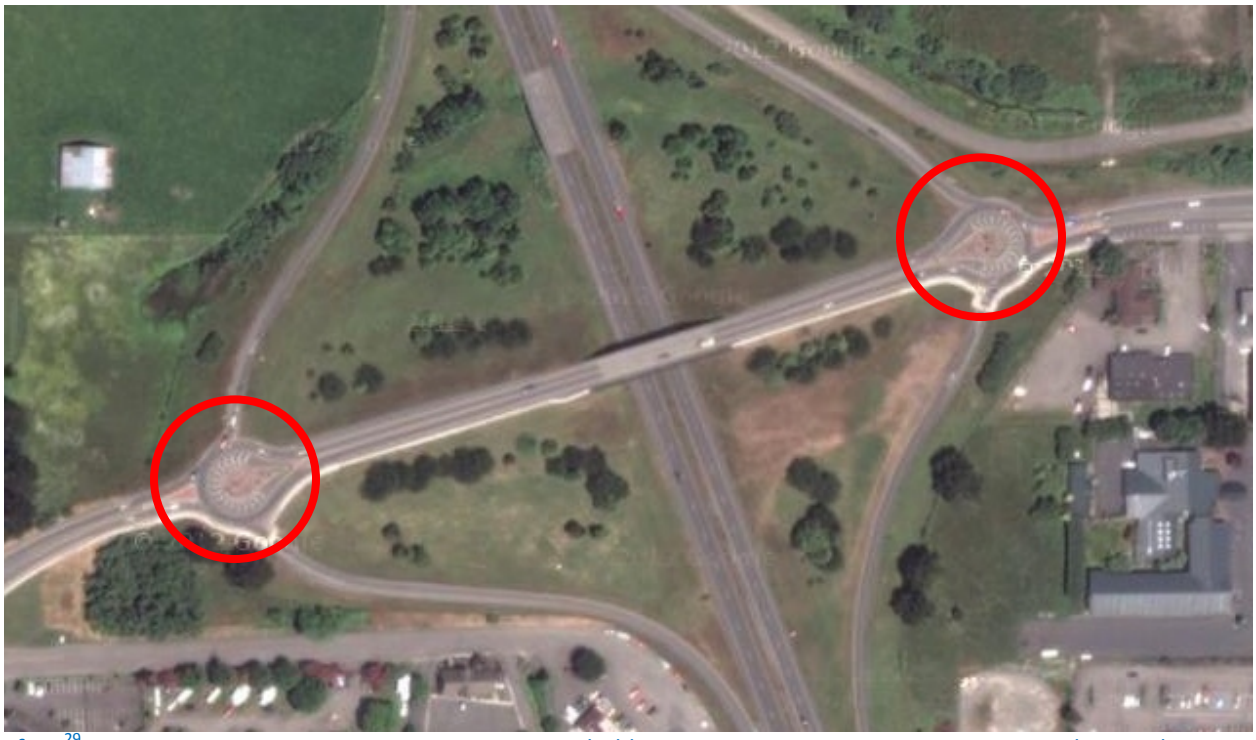
Regional View/HUM_101_88.803 [27]

History

In 2001, Caltrans evaluated building roundabouts at the intersections for both eastbound and westbound on- and off-ramps at Guintoli Lane where there were two, four-way stop sign intersections. Caltrans evaluated the traffic volumes for signalization, and determined that the intersections did not meet signal warrants; however, a roundabout would be permissible. In 2002, the **city of Arcata** asked Caltrans to coordinate with the local agency and the local community on the development of dual roundabouts on eastbound and westbound Guintoli Lane at U.S. Route 101. Construction was completed in 2004 for the dual roundabouts. Caltrans monitors and maintains the roundabouts.



Before [28] District 1, Humboldt County, Arcata, CA - U.S. Route 101 and Guintoli Lane



After [29] District 1, Humboldt County, Arcata, CA - U.S. Route 101 and Guintoli Lane

Ground View [30] District 1, Humboldt County, Arcata, CA - U.S. Route 101 and Guintoli Lane

District 1–Mendocino County–Fort Bragg, CA
State Route 1 and Simpson Lane

= Project Area

Region View/MEN_1_59.250[31]

History

The purpose of the **Simpson Lane Intersection Project** was to enhance safety and reduce travel delays at the intersection of State Route (SR) 1 and Simpson Lane in Mendocino county. The project was initiated due to lengthy delays and safety concerns associated with persistent congestion at the intersection. Caltrans coordinated with local agency staff and the community to select a multi-lane roundabout as the preferred project alternative. Construction of the Simpson Lane roundabout was completed in November 2011.

Before [32] District 1, Mendocino County, Fort Bragg, CA – SR 1 and Simpson Lane

After [33] District 1, Mendocino County, Fort Bragg, CA – SR 1 and Simpson Lane

["Ground View" photo not yet available]

District 1–Mendocino County–Hopland, CA
State Route 175 and Main Street

= Project Area

Regional View/MEN_175_1.140[34]

History

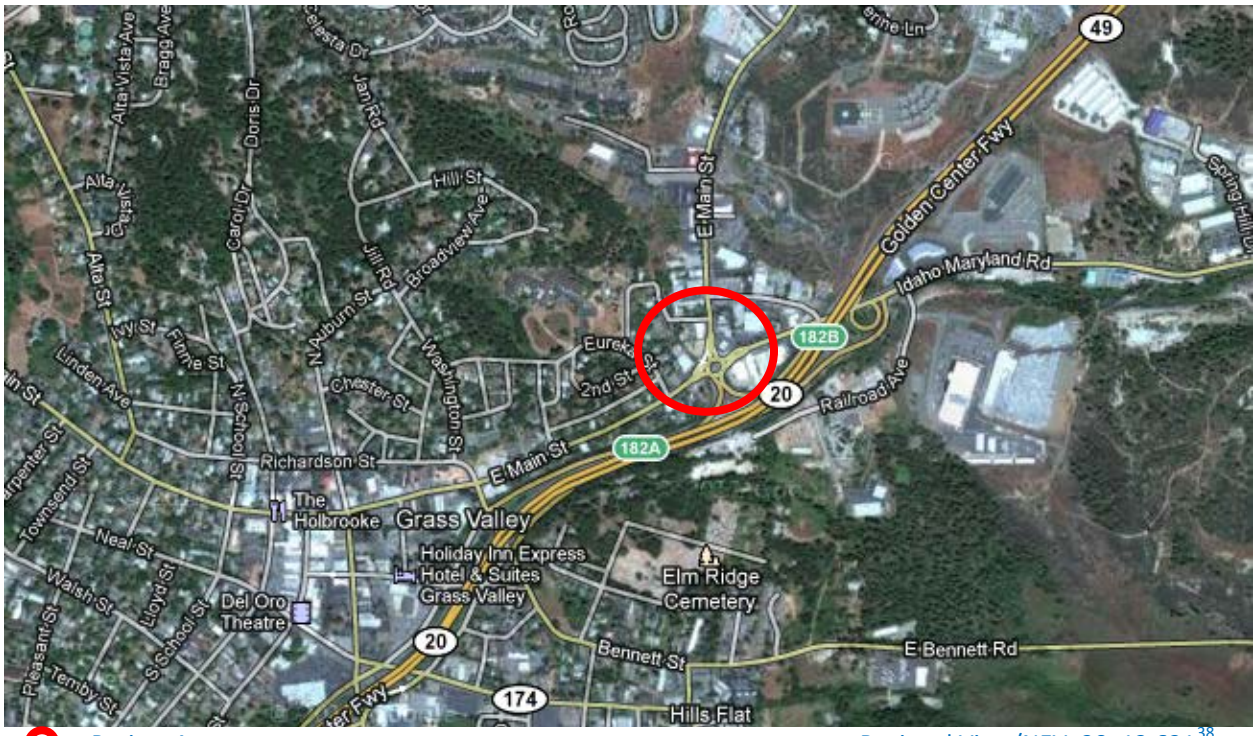
In 2006, the **city of Hopland** coordinated with Caltrans on the development of a roundabout at the intersection of Main Street and SR 175 to replace a three-way stop controlled intersection. The need was to improve safety. Caltrans evaluated the intersection and concluded that improved access to SR 175 was needed but did not warrant a signalized intersection, but a roundabout was permissible and deemed viable. Construction was completed in 2008.

Before [35] District 1, Mendocino County, Hopland, CA - SR 175 and Main Street

After [36] District 1, Mendocino County, Hopland, CA - SR 175 and Main Street

Ground View [37] District 1, Mendocino County, Hopland, CA - SR 175 and Main Street

District 3–Nevada County–Grass Valley, CA
State Route 20 and Main Street



= Project Area

Regional View/NEV_20_13.631[38]

History

In 2007 an initial study was prepared by the **city of Grass Valley** to improve the intersection of East Main Street and Idaho-Maryland Road. A project was needed to improve operations of the intersection and freeway which were operating at an unacceptable Level of Service (LOS).

Caltrans and the city of Grass Valley worked in coordination to develop a roundabout, including a southbound-to-westbound bypass lane and dual entry lanes for the Idaho-Maryland approach. This concept was determined by Caltrans and the city to be the only viable improvement that met the goals of providing acceptable operation of both the intersection and the freeway. Construction of the partial dual-lane roundabout was completed in 2008 and is maintained by the city of Grass Valley.

Before [39] District 3, Nevada County, Grass Valley, CA - SR 20 and Main Street

After [40] District 3, Nevada County, Grass Valley, CA - SR 20 and Main Street

Ground View [41] District 3, Nevada County, Grass Valley, CA - SR 20 and Main Street

District 3–Nevada County–Town of Truckee, CA
Interstate 80 SB and NB

= Project Area

Regional View/NEV_80_R000.826 and R000.751[42]

History

In 2001, Caltrans proposed the installation of traffic signals at the ramp intersection of I-80 and SR 89 in 2001, but the **town of Truckee** officials opposed the idea.

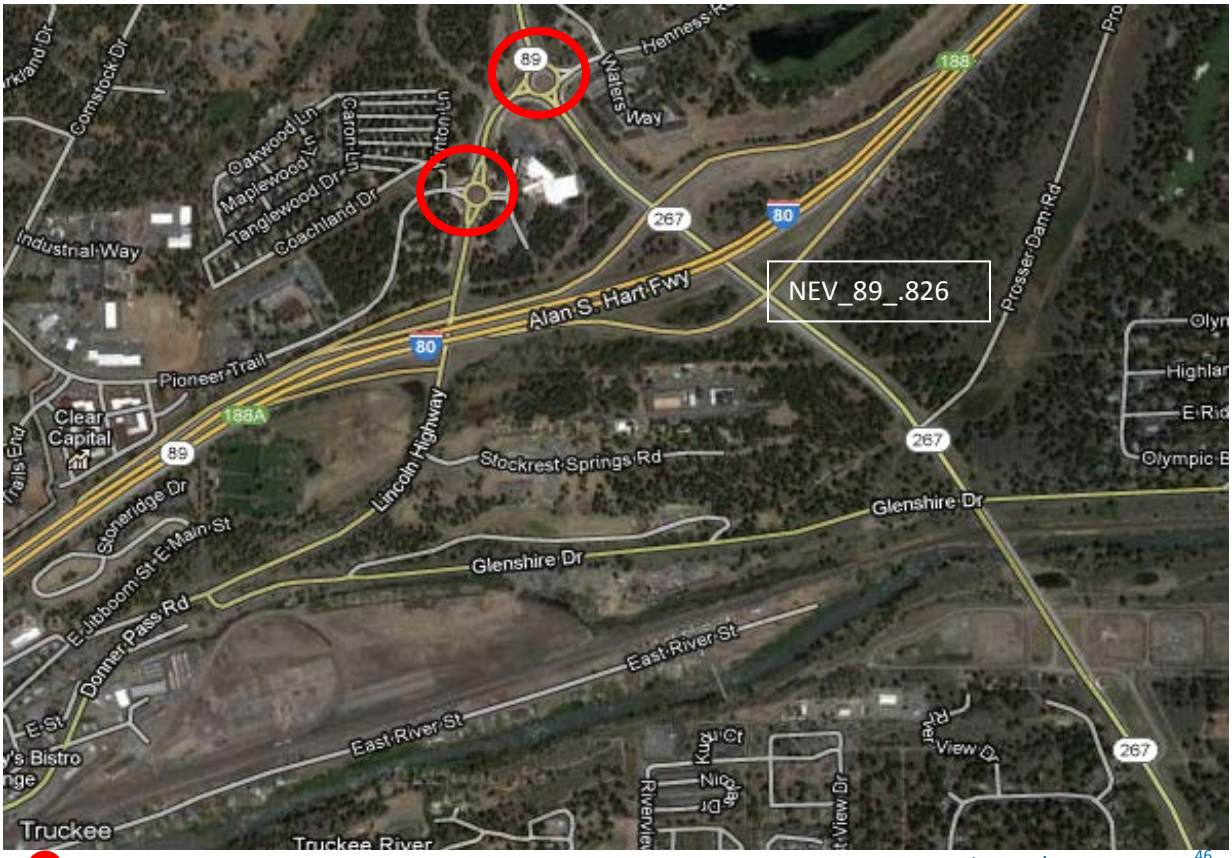
As an alternative, the town of Truckee proposed the preparation of a study to determine the feasibility of constructing roundabouts in lieu of signals, which was consistent with the Town of Truckee General Plan. This plan promotes the use of roundabouts rather than signals at major intersections when feasible. Caltrans and the town of Truckee agreed to use the money initially dedicated to traffic signals toward the dual roundabouts project. Traffic studies indicated the need for dual left turn lanes to the WB on-ramp, for future recreational peaks, but local concerns eliminated this feature. In 2005, the SR 89/ I-80 Diamond Interchange Dual Roundabouts project was completed in Truckee and opened to the public. Caltrans monitors and maintains both roundabouts, which at the time of completion were the first of their kind in Northern California.

Before [43] District 3, Nevada County, Town of Truckee, CA – I-80 SB and NB

After [44] District 3, Nevada County, Town of Truckee, CA – I-80 SB and NB

Ground View [45] District 3, Nevada County, Town of Truckee, CA – I-80 SB and NB

District 3–Nevada County–Town of Truckee, CA
State Route 89N/Donner Pass Road



= Project Area

Regional View/NEV_89_.826[46]

History

In 2006, the **town of Truckee** proposed the construction of a partial two-lane roundabout at the intersection of SR 89 North at Donner Pass Road in the town of Truckee. This roundabout, along with a second proposed roundabout approximately three-tenths of a mile north on SR 89, were to be constructed simultaneously to improve operations as a result of increased development along this stretch of highway. These roundabouts were constructed in 2007.

Before [47] District 3, Nevada County, Town of Truckee, CA - SR 89N/Donner Pass Road

After [48] District 3, Nevada County, Town of Truckee, CA - SR 89N/Donner Pass Road

Ground View [49] District 3, Nevada County, Town of Truckee, CA - SR 89N/Donner Pass Road

District 3–Nevada County–Town of Truckee
State Route 89N/Alder Drive/Prosser Dam Road

= Project Area

Regional View/NEV_89_1.150[50]

History

In 2006 the **town of Truckee** proposed the construction of a single-lane roundabout at the intersection of SR 89 North at Alder Drive-Prosser Dam Road in the town of Truckee. Caltrans and the town of Truckee agreed to develop the roundabout in conjunction with other developed roundabouts on SR 89. The three roundabouts would be approximately three-tenths of a mile apart on SR 89 and were originally submitted to Caltrans as one major project to be constructed simultaneously. Construction on the third roundabout was completed in October 2011.

Before [51] District 3, Nevada County, Town of Truckee – SR 89N/Alder Drive/Prosser Dam

[“After” photo not yet available]

Ground View [52] District 3, Nevada County, Town of Truckee – SR 89N/Alder Drive/Prosser Dam

District 4–Marin County–City of Tiburon, CA
State Route 131/Paradise Drive

= Project Area

Regional View / MRN_131_4.392[53]

History

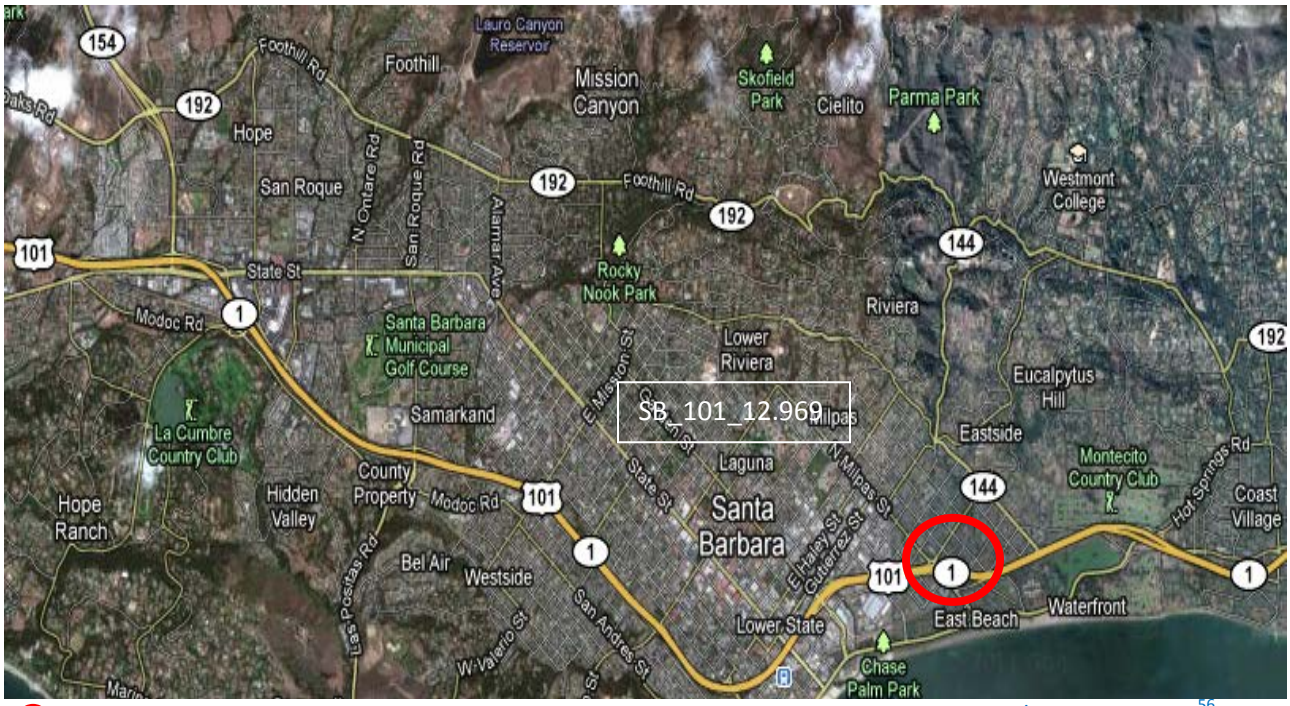
Built in 1984, the **city of Tiburon** traffic circle was constructed with three entry points (two yields and one stop sign). The traffic circle allowed for traffic to turn around (U-Turn) without using streets in residential neighborhoods. The traffic circle also provided numerous benefits, such as less traffic congestion, cleaner air, beautiful aesthetics, and high usage by locals and tourists.

[“Before” photo not yet available]

After [54] District 4, Marin County, City of Tiburon, CA - SR 131/Paradise Drive

Ground View [55] District 4, Marin County, City of Tiburon, CA - SR 131/Paradise Drive

District 5–Santa Barbara County–City of Santa Barbara
US 101SB/Milpas Street

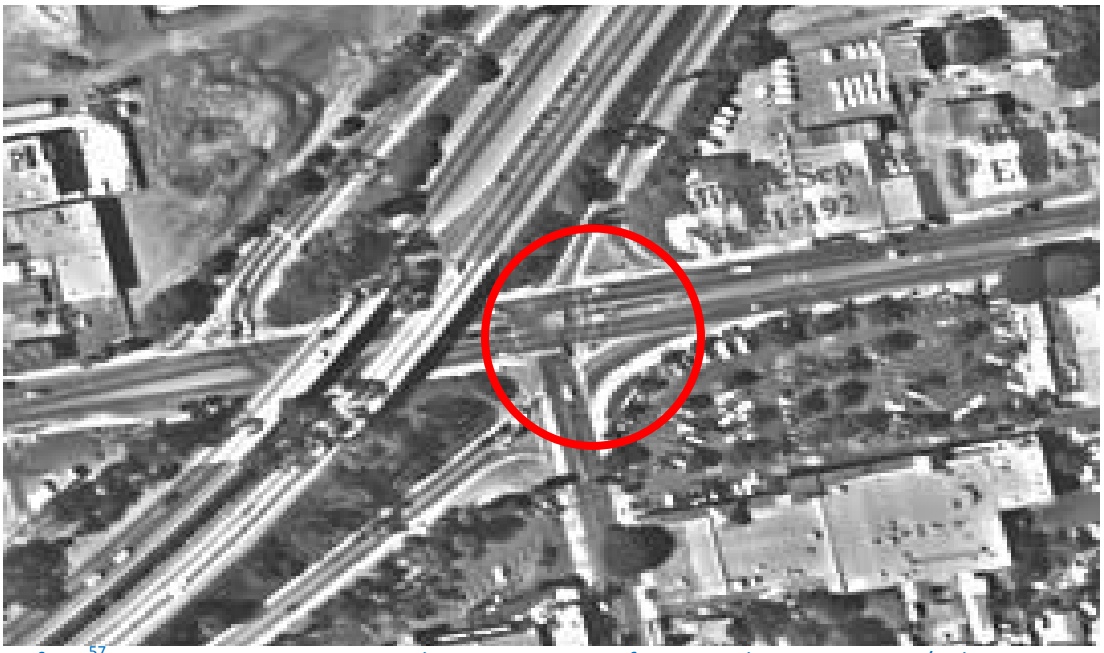


= Project Area

Regional View/SB_101_12.969[56]

History

Caltrans relinquished a portion of SR 144 (Milpas Street/U.S. 101 to Salinas Street) to the **city of Santa Barbara** in 1999. In 2000, the city of Santa Barbara constructed a roundabout at a formerly five-leg signalized intersection. The oblong roundabout on Milpas Street/U.S. 101 interchange consists of a yield-controlled five-legged roundabout that connects Milpas Street with Carpinteria Street and U.S. 101 northbound ramps.

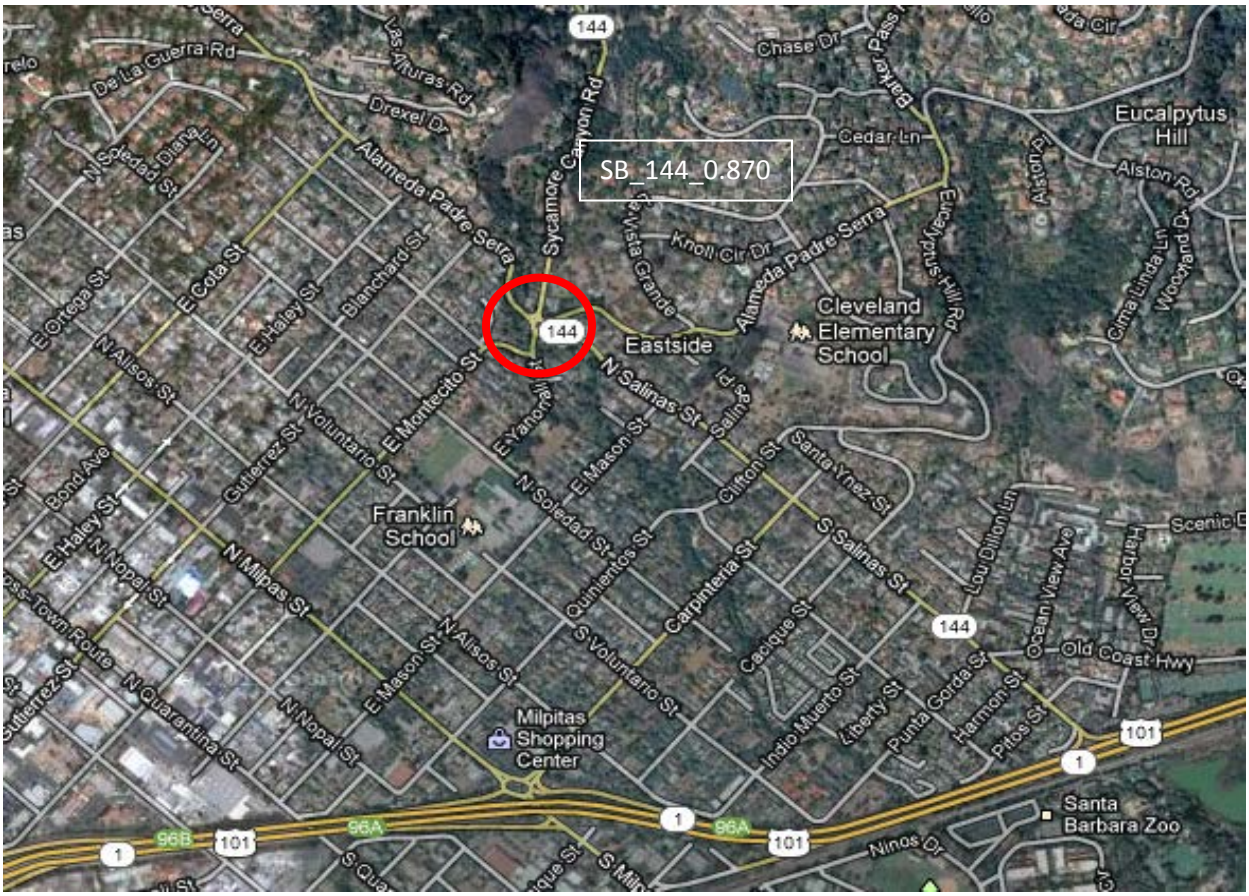


Before [57] District 5, Santa Barbara County, City of Santa Barbara – US 101SB/Milpas Street

After [58] District 5, Santa Barbara County, City of Santa Barbara – US 101SB/Milpas Street

Ground View [59] District 5, Santa Barbara County, City of Santa Barbara – US 101SB/Milpas Street

District 5–Santa Barbara County–Santa Barbara, CA
State Route 144 and Five Points



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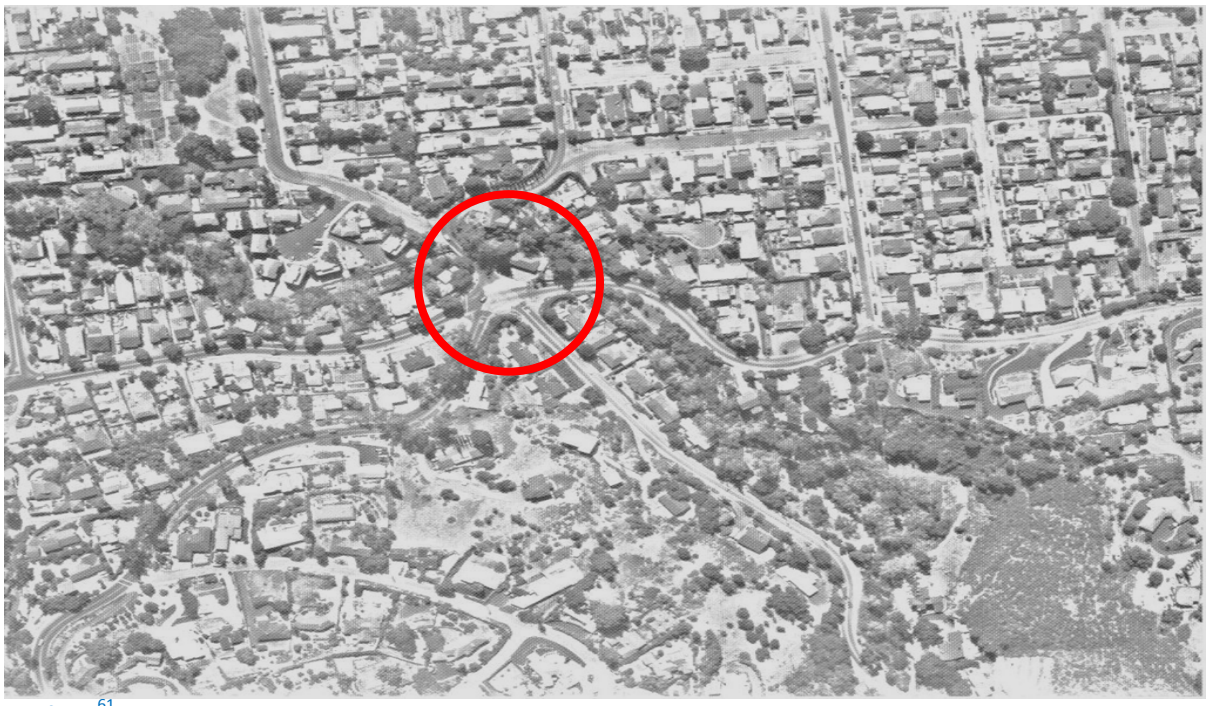
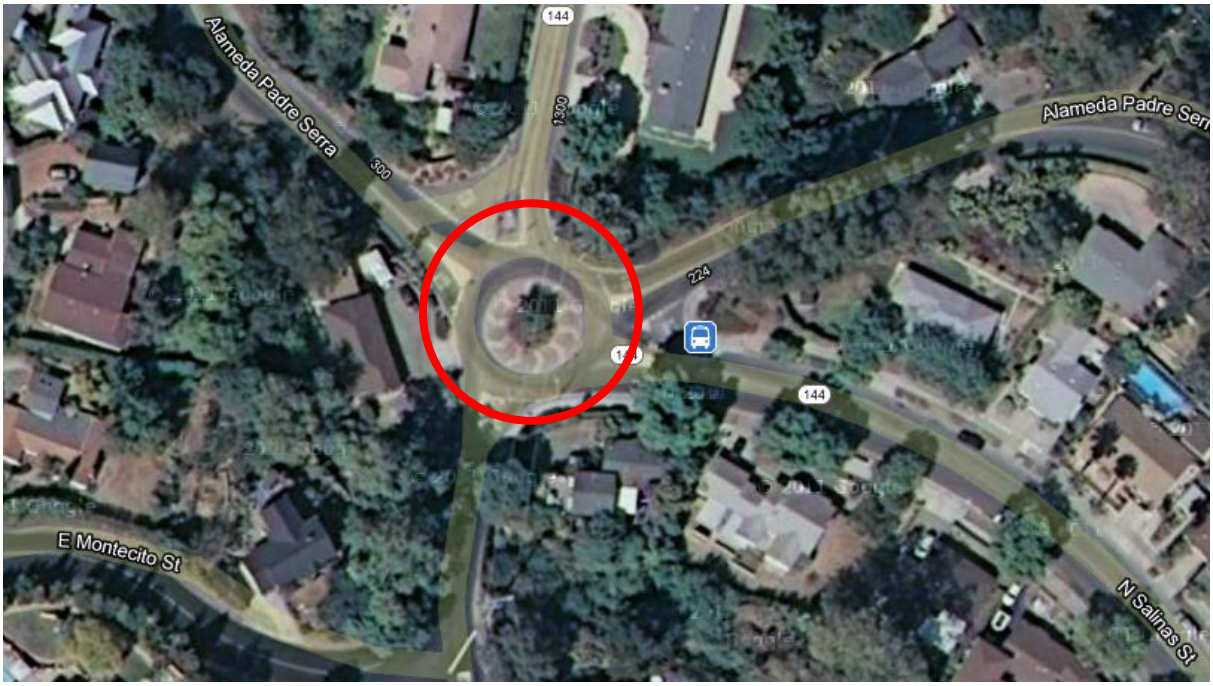
Region View/SB_144_0.870[60]

History

The **city of Santa Barbara** constructed a roundabout in 1992 at the intersection of Alameda Padre Serra, Route 144 (Salinas Street), Montecito Street, and Route 144 (Sycamore Canyon Road). Caltrans has relinquished a portion of SR 144 (Salinas Street) to the city of Santa Barbara and currently SR 144 (Sycamore Canyon Road) begins at the edge of the roundabout. The intersection experienced operational problems due to delay and confusion over who had the right of way. By placing a roundabout at the intersection it provided operational improvements for vehicles, pedestrians, and bicyclists.



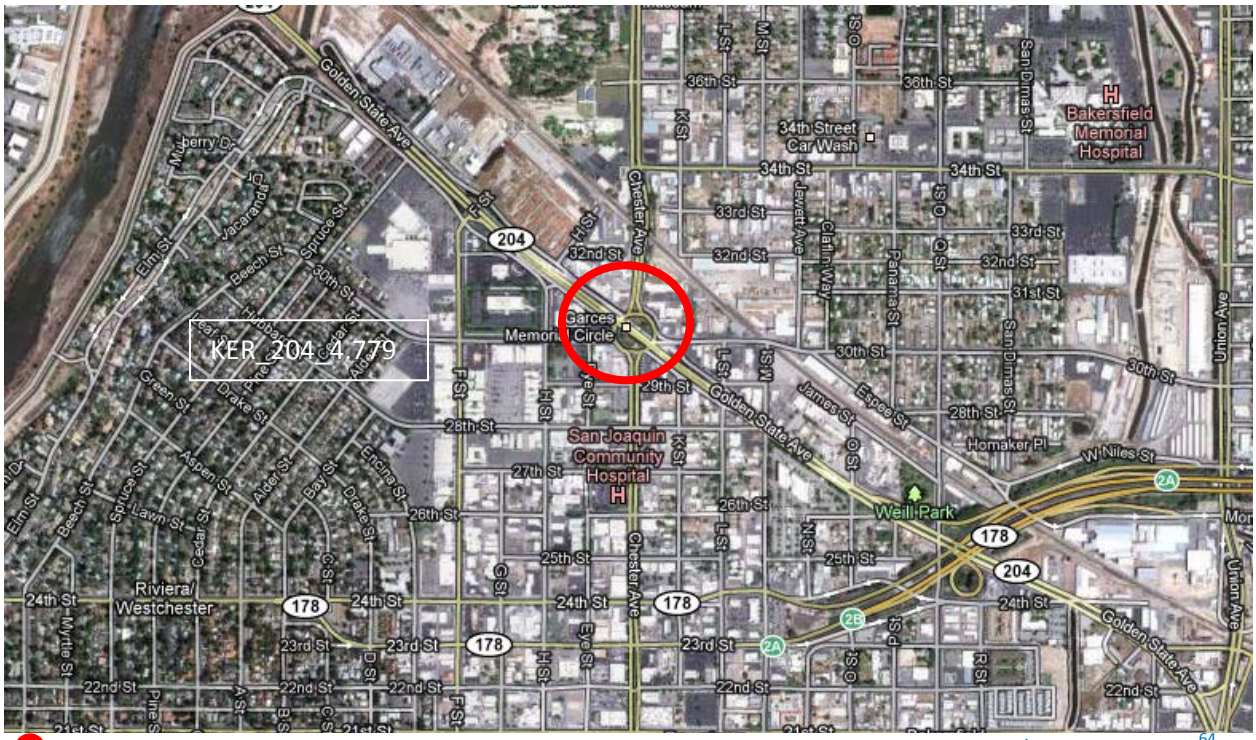
Before [61] District 5, Santa Barbara County, Santa Barbara, CA – SR 144 and Five Points



After [62] District 5, Santa Barbara County, Santa Barbara, CA – SR 144 and Five Points

Ground View [63] District 5, Santa Barbara County, Santa Barbara, CA – SR 144 and Five Points

District 6–Kern County–City of Bakersfield, CA
State Route 204/Chester Ave



= Project Area

Regional View/KER_204_4.779[64]

History

In 1935, the **Garces Traffic Circle** was constructed[65], along with the development of SR 99 in Kern County. The roundabout is located at the intersection of Chester Avenue, Golden State Avenue (now SR 204) and 30th Street.

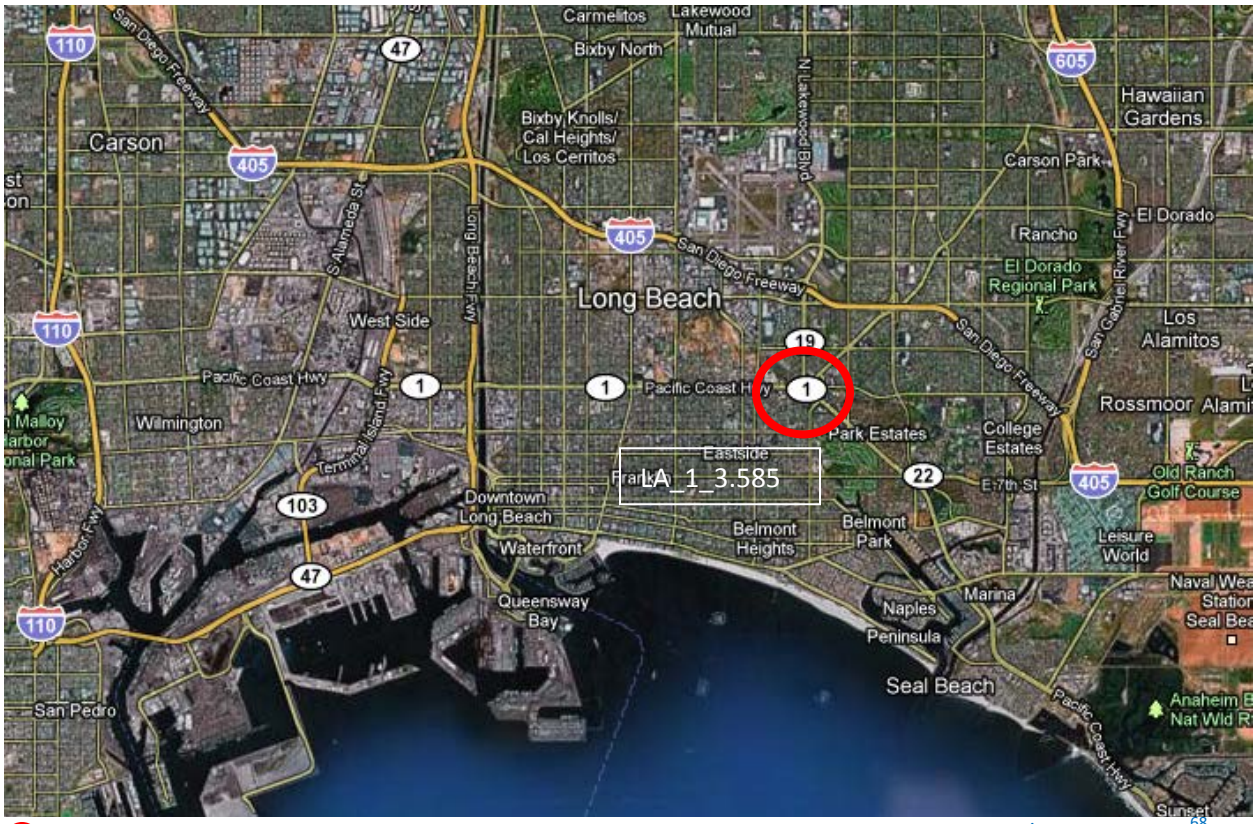
After its construction, residents of the city saw the circle's promise as a gateway to the city and through the Works Progress Administration, Artist Juan Paulo-Kangas was commissioned to create a statue/memorial to Garces at the center of the circle. The statue and traffic circle are listed as California State Historical Landmark #277. The traffic circle is not considered a roundabout because a stop sign is placed at an entry point.

[“Before” photo not available]

After [66] District 6, Kern County, City of Bakersfield, CA – SR 204/Chester Ave

Ground View [67] District 6, Kern County, City of Bakersfield, CA – SR 204/Chester Ave

District 7–Los Angeles County–Long Beach, CA
State Route 1/Lakewood Blvd



= Project Area

Regional View/LA_001_3.585[68]

History

In 1993, the intersection of Lakewood Boulevard (SR 19), Pacific Coast Highway (SR 1) and Los Coyotes Diagonal in **Long Beach**, was converted from an old-style traffic circle to a modern roundabout. This conversion included modifications to each of its entries and exits, including Yield signs (replacing Stop signs) to increase the speed and ease of traffic entering and exiting the circle and reducing the waiting time to enter. Also added were wider lanes, redundant traffic signs, and devoted lanes for traffic traveling only 90 of the 360 degrees of the circle. After the conversion, both the total auto accident and injury rate dropped significantly. The roundabout handles over 60,000 vehicles a day.

[“Before” photo not available]

After [69] District 7, Los Angeles County, Long Beach, CA - SR 1/Lakewood Blvd

Ground View [70] District 7, Los Angeles County, Long Beach, CA - SR 1/Lakewood Blvd

District 7–Los Angeles County–Santa Clarita, CA
Interstate 5 NB and SB/Hasley Canyon Road

= Project Area

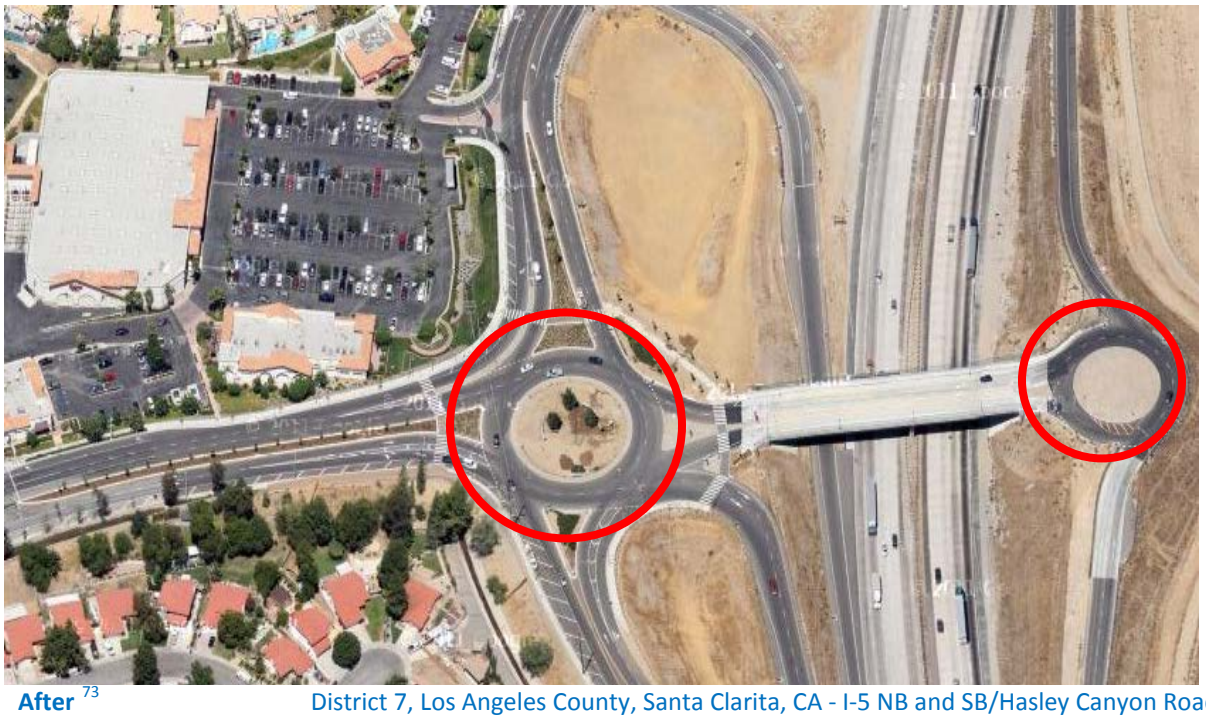
Regional View/LA_005_R56.763[71]

History

In 1968, the **I-5 interchange with Hasley Canyon Road in Castaic** was designed as a tight diamond with a two-lane overcrossing. Growth in the northern Santa Clarita-Castaic area was projected to create high traffic demand exceeding capacity at the Hasley Canyon Road by 2020. A partnership, including the Valencia Company, Los Angeles County, FHWA and Caltrans recognized that the growing traffic demand could not be accommodated by the existing interchange, and the Valencia Company commissioned a study of various alternative plans for increasing the capacity of the interchange. It was determined that a hybrid design including a dual roundabout interchange combined with southbound I-5 hook on- and off-ramps to The Old Road/Sedona Way would be the preferred alternative.

In 2007, construction of the roundabout commenced. Construction of the project included the multi-lane roundabouts on the east and west sides of the I-5, as this project widened the I-5, the Old Road, and Hasley Canyon Road. When first opened, there were numerous complaints from local residents about the choice of a roundabout. However, the complaints subsided after people became familiar with the roundabout and additional signage provided motorists with clear guidance. The project was completed in 2010.

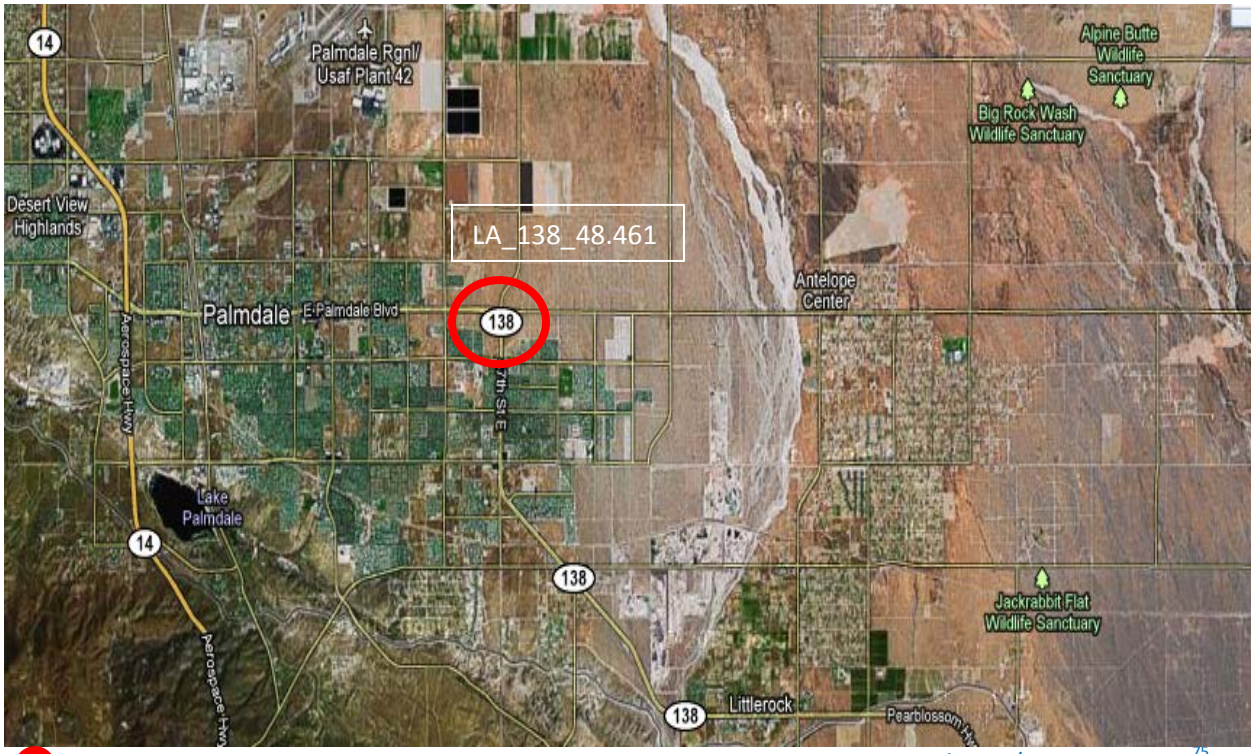
Before [72] District 7, Los Angeles County, Santa Clarita, CA - I-5 NB and SB/Hasley Canyon Road



After [73] District 7, Los Angeles County, Santa Clarita, CA - I-5 NB and SB/Hasley Canyon Road

Ground View [74] District 7, Los Angeles County, Santa Clarita, CA - I-5 NB and SB/Hasley Canyon Road

District 7–Los Angeles County–Palmdale, CA
State Route 138/47th-50th



= Project Area

Regional View/LA_138_48.461 [75]

History

Prior to 1962, SR 138 ran east-west through **Palmdale** and turned south at the four-legged intersection of Palmdale Boulevard/47th Street East/50th Street East. SR 138 is a major truck route between the San Joaquin Valley and the Riverside-San Bernardino Inland Empire region. In 1962, SR 138 was realigned with a 1000-foot radius, 90-degree curve with a design speed of 50 mph. There were two skewed intersections at each end of the curve: SR 138 and Palmdale Boulevard, SR 138 and 47th Street East. The growth of traffic volumes since 1962 resulted in a number of accidents, some of them serious injury and fatal accidents, at both the State and city-owned intersections.

In 2003, due to the continuing potential for high speed approach-turn accidents at the two skewed intersections, and problems caused by the proximity to the intersection of Palmdale Boulevard/47th Street East/50th Street East, it was decided to install a roundabout. Construction was completed in 2009. The project has been successful, with the L.A. County Sheriff's Department and the California Highway Patrol reporting no fatal accidents following completion of the roundabout.

Before [76] District 7, Los Angeles County, Palmdale, CA - SR 138/47th-50th

After [77] District 7, Los Angeles County, Palmdale, CA - SR 138/47th-50th

Ground View [78] District 7, Los Angeles County, Palmdale, CA - SR 138/47th-50th

District 8–Riverside County–Cabazon, CA
Interstate 10/Apache Trail

= Project Area

Regional View/RIV_010_R017.501[79]

History

In 2003, the Morongo Band of Mission Indians (Tribe) proposed an installation of traffic signals to mitigate traffic impacts to the **Apache Trail Interchange** generated by the Morongo Casino Expansion. In consulting among the Tribe, Caltrans and the County of Riverside, it was agreed that traffic signals would not work due to the traffic volumes and close proximity of the frontage roads and the railroad. Caltrans and the County of Riverside, suggested that the Tribe look into a dual roundabouts alternative. After doing some traffic simulation studies, it was decided that the roundabouts would be the best option.

In 2004, the Tribe presented the proposed roundabouts to the Tribal Council and obtained approval to fully fund the project. The dual roundabouts at Apache Trail interchange were open to traffic in 2008. The roundabouts greatly reduced traffic congestion at the ramp intersections and the backup of traffic onto I-10. Caltrans has retained the maintenance of the roundabouts, while the Tribe has committed to do a follow up landscape project that will be maintained by the Tribe in perpetuity.

Before [80] District 8, Riverside County, Cabazon, CA - I-10/Apache Trail

After [81] District 8, Riverside County, Cabazon, CA - I-10/Apache Trail

Ground View [82] District 8, Riverside County, Cabazon, CA - I-10/Apache Trail

Appendix

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Photos: Digital Highway Inventory Photography Program, Courtesy of Caltrans Division of Structure Design Services, Office of Photogrammetry

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